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THE

STUDENT'S ATLAS.

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LONDON

Daniel W. Mead.

THE
STUDENT'S ATLAS
IN TWELVE CIRCULAR MAPS

(ON A UNIFORM PROJECTION AND ONE SCALE).

WITH TWO INDEX MAPS.

INTENDED AS A VADE-MECUM FOR THE STUDENT OF HISTORY, TRAVEL,
GEOGRAPHY, GEOLOGY, AND POLITICAL ECONOMY.

WITH A LETTERPRESS INTRODUCTION, ILLUSTRATED BY SEVERAL CUTS.

BY
RICHARD ANTHONY PROCTOR,

AUTHOR OF 'THE LIBRARY STAR ATLAS,' 'THE SCHOOL STAR ATLAS,' 'THE GEOMONIC
STAR ATLAS,' 'THE STARS IN THEIR SEASONS,' THE ARTICLES ON ASTRONOMY IN
'THE ENCYCLOPÆDIA BRITANNICA' AND APPLETON'S 'AMERICAN CYCLOPAEDIA,'
ETC. ETC.

LONDON:
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P R E F A C E.

THIS LITTLE WORK, like nearly every work I have yet produced, was originally prepared to meet my own wants as a student. Repeatedly, when studying history, ancient and modern, geology, physical geography, works of travel, and even works of fiction, I have been troubled by the difficulty of readily forming clear and exact ideas of the relations of different parts of the earth's surface to each other. I might not, however, have been led to construct a series of maps like the present, by which this difficulty is removed, had I not had occasion in my astronomical work to require a complete one-scale atlas of the world, such as this atlas practically is. But in preparing projections of the earth, such as those in my 'Seasons Illustrated' and 'Old and New Astronomy,' and still more in doing such work on the larger scale required for my 'Studies of Venus Transits' and kindred treatises, I found all ordinary atlases so inconvenient and unsatisfactory that I was led to prepare for my own special service a series of maps, of which the maps of the present atlas may be regarded as reductions. I have found these maps

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so convenient and useful for reference—they have, indeed, been already nearly worn out in my service—that I have thought a similar series might be useful to other students. The idea thus formed has been admirably carried out by Mr. F. S. Weller, F.R.G.S., and under very favourable conditions, because of his thorough familiarity with the requirements of geographical mapping; so that the present atlas, though on a smaller scale, is calculated to be a much more useful work for other students than the comparatively rough maps I prepared for myself.

Among other novelties, the ocean currents are for the first time mapped on a uniform scale, and without appreciable distortion, in this series. I think students will also be glad to see the contents of the several maps indicated on the back of each.

RICHARD A. PROCTOR.

CORONA LODGE,
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INTRODUCTION.

THERE are some purposes which ordinary atlases fail to fulfil, and could not well fulfil even if they were free from the faults which characterise all the atlases in use. Some of these faults are serious ; and when we consider the length of time during which geographers have had the problem of atlas-making before them, it seems singular that they have not been long since corrected. The ill-chosen methods of projection which were naturally enough employed when geography was in its infancy remain in vogue still. An even worse fault is, that even in the use of unsatisfactory methods there is no congruity. Some maps of large tracts, as Africa and South America, are on old Flamsteed's projection, others, as the maps of Europe and North America (generally), are on the conical projection, others, as the maps of Asia and North America (occasionally), on a curious mixture of Flamsteed's and the conical projections, which is perhaps the worst ever devised for mapping. The addition of a scale of miles to most of these maps is misleading—the distances measured in different directions being in many cases on quite different scales. Maps of smaller tracts are drawn usually on the conical projection, and this is well enough, though not the best that might be ; but they differ too much in scale to give correct ideas. The maps of hemispheres could not perhaps be on a much better projection than that usually employed—a modification of the equidistant projection—but such maps are quite insufficient to bring the teachings of the

atlas as a whole into unison. And when, as usual, a map on Mercator's projection is added, the ideas suggested in regard to the position and relative extent of the different countries and tracts of the earth become for the most part erroneous, while they are often very confusing even when approaching in some degree to correctness.

I have not here attempted, however, to produce an atlas of the kind commonly in use. I have very definite ideas as to the way in which the faults of ordinary atlases might be corrected. In one respect, indeed, this little atlas illustrates what, I take it, should be a characteristic feature in the construction of all atlases—namely, that all the maps except those expressly intended as index maps (or for other reasons meant to show either the whole earth at once, or hemispheres) should be on the same central projection—the equidistant. For thus distortion and change of scale are reduced to a minimum, while directions are indicated with the nearest approach possible to correctness—as the study of the maps of the present atlas (each of which shows fully a tenth of the earth's surface, yet with scarcely any distortion or change of scale) will serve to show. But the object I have here had chiefly in view has been the production of an atlas which, by uniformity of scale, simplicity of character, and symmetry of arrangement, may serve some of those purposes which even the best-planned atlas of the ordinary kind could not be expected to fulfil.

In studying the geography of the earth as a whole, in considering the larger problems of geology, in reading history ancient and modern, in discussing problems relating to trade and commerce, and in dealing with many other subjects of inquiry, occasion constantly arises for the means of recognising clearly and readily the relations of the different parts of the earth to each other. An ordinary atlas shows us Europe and it shows us North America, but it presents the two continents on different scales, and, except in the imperfect maps of the two hemispheres or

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the still more misleading Mercator's charts, it does not show how the two continents are situated with regard to each other. Of the Atlantic Ocean, which is almost as important and interesting a region of our earth as any continent (when we consider it in relation to the lands which border on it), the ordinary atlas gives no map at all. Anyone who wishes to note the nature and relative directions of the tracks across the Atlantic between different parts of the surrounding shores can learn nothing from an ordinary atlas except what is false and misleading. It is the same with all the oceans. The relations of their various parts to each other and to the surrounding continents are not presented at all except in the maps of hemispheres and in Mercator's charts—and in those so incorrectly as to teach more error than truth. I do not say this as finding fault with the existing atlases. I do not indeed see how these defects could be corrected without making atlases unwieldy and inconvenient, or without introducing other defects which would be even more serious in relation to the purposes for which ordinary atlases are constructed. But for students of geology, of general geography, of what the Germans conveniently call Erdkunde (for which we have as yet no word in English but the atrocity, at once insufficient and incorrect, 'physiography'—though Earth-Lore might serve), for readers of history, ancient, modern, and in actual progress, for travellers and students of books of travel, and in fine for all who have occasion, as in these days every thoughtful person has occasion, to consider the earth as a whole, a companion atlas, supplementing the teachings of ordinary atlases, but for many purposes sufficient by itself for reference and study, is manifestly needed. Such an atlas I have endeavoured here to produce, on a small but sufficient scale.¹

The plan I have adopted for distributing the surface of

¹ I could not conveniently incur the expense and possible loss of trying the experiment on a larger one.

the earth into maps, and for the construction of the several maps, has been that which I had already followed in preparing my Library Star Atlas and School Star Atlas. I suppose the globe divided into twelve equal parts corresponding with the twelve faces of an inclosed or inclosing dodecahedron, the regular solid with twelve pentagonal faces represented in two aspects in figs. 1 and 2. If one

FIG. 1.

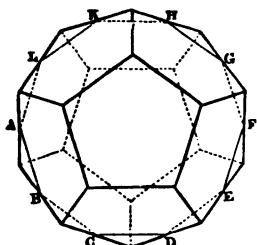
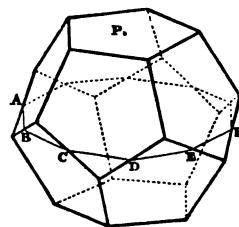


FIG. 2.



The dodecahedron or 12-sided regular solid.

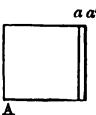
imagines such a solid formed with its faces made of some elastic material, and the interior to expand until the flat faces became all so far curved as to form parts of one and the same spherical surface, the twelve spherical pentagons so produced would correspond with the twelve divisions of the globe in this atlas. But each map is made to include the spherical surface circumscribing the pentagon really belonging to it, so that each map overlaps five others. By this arrangement not only are the maps made severally more instructive, but the comparison of one with the other is greatly helped, and this without enlarging the page necessary for each map, or increasing the distortion and scale-variation.

Each map is on the true equidistant construction, so that distances measured in the direction of a radius are on the same scale throughout. Distances measured at right angles to the direction of a radius slowly increase with

distance from the centre, but even at the circumference of each map are only increased by one fourteenth part—a change which is very easily taken into account. How little distortion arises from this cause will be seen if the shape of one of the spaces near the middle of Maps II., III., &c., to XI., is compared with the shape of one of the spaces between the same latitude-parallels near the edge. The variation of areas is proportional to the variation of lengths at right angles to a radius, being thus only one-fourteenth at the edge.¹ The amount of change of distortion, linear distance, and of area is shown in fig. 3, where $\Delta\alpha$ is supposed to represent the true shape of a space at the top and bottom of a map : this space by the maximum distortion in the present series is altered into the shape $\Delta\alpha'$.

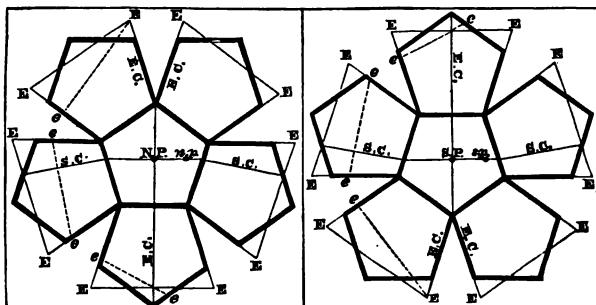
The dark pentagons of fig. 4 serve to illustrate the

FIG. 3.



Illustrating the maximum distortion of the maps of this atlas.

FIG. 4.



Illustrating the division of the globe into twelve pentagonal areas.

arrangement by which the twelve pentagons into which the globe is divided in the present atlas are distributed into

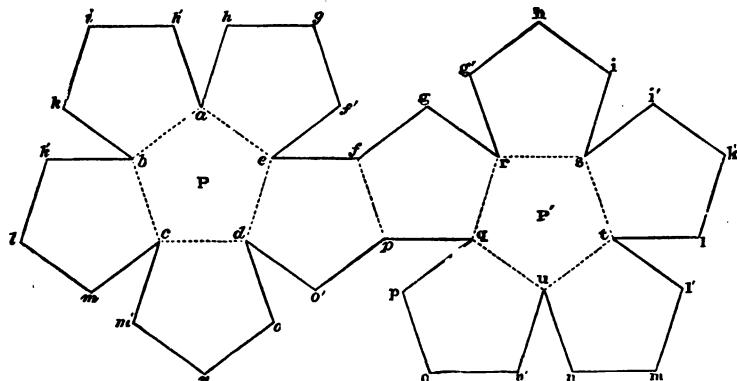
¹ The distortion and variation of shape and area in each map may be illustrated as follows:—Suppose the meridians to about latitude 53° (37° from the Pole) flexible, the surface of the globe to

two polar maps, five northern, and five southern maps, each overlapping the equator. Only it is to be observed that the arrangement in fig. 4 is that followed in my Library and School Star Atlases. In the present series it has been found more convenient to have the six northern maps as in the right-hand part of fig. 4, the left-hand part illustrating the arrangement of the six southern maps.¹ The Index-Maps show how the overlaps come in.

that distance from the pole being elastic. Then if the meridians to that distance be supposed to straighten so that the whole set form a series of radiating lines in a plane, the slight stretching of the surface between the extremities of these meridians would correspond to the change which the method of projection we have employed has introduced into these maps.

¹ A full account of the dimensions, centring, &c., of the maps of what may be called a dodecahedral series will be found in the introduction to my Gnomonic Star Atlas (mathematically pre-

FIG. 5.



Showing how a dodecahedron may be formed out of card.

sented), and of my Library Star Atlas, where it is dealt with in more popular form. The student will find it a useful exercise to construct a dodecahedron by cutting a piece of card into the form shown in fig. 5 (cutting half through along the dotted lines), and folding it up into a dodecahedron such as is pictured in figs. 1 and 2.

The division of the globe being thus arranged, and the equidistant projection selected, the only point to be determined was the selection of the longitudes for the central meridians of the several maps. Obviously the choice lay between two arrangements. The great meridional circle through Greenwich must pass centrally either through Maps II. and VII. (the former of which is the first of the non-polar northern maps), or through Maps VI. and XI. (the latter of which is the last of the non-polar southern maps). The first corresponds with the arrangement shown in fig. 4, the lowest map of the first or left-hand set being Map II., and the uppermost of the other set being Map VII.; the second corresponds with the arrangement when the right- and left-hand sets of fig. 4 are interchanged.

At first my preference was for the former arrangement, which would have brought England to the central meridian of Map II., the first non-polar map, and would further have made the division of the terrestrial globe identical with the division of the celestial globe in my Library and School Star Atlases. But when I had plotted out the two Index-Maps on this plan, I saw that the atlas would be made much more instructive and suggestive if the other arrangement were adopted. It brought Great Britain from the central meridian of the first polar map to the extreme edge of that map. But Britain, though great, is not the world; and the whole world was (as will presently appear) much better distributed by the second arrangement. Moreover, there were advantages even in regard to my native land, which should have satisfied the feeling of patriotism had that been such as to move me to spoil my atlas rather than displace Great Britain from a central position. If England was no longer on the central meridian of the first non-polar map, she was brought to the absolute centre of the three Maps I., II., and X. (the north polar map and the first and last non-polar northern maps). By a trifling expansion of each of these maps where their boundaries

cross England, the whole of the British Isles could be shown in each map, and thus the relation of the great centre of the world's commerce to other lands be much better displayed than by the other arrangement.¹

Considering the maps in order, we see the advantages of the arrangement finally adopted. It will be seen, I believe, that the atlas is calculated to be useful for the purposes which it was intended to subserve.

THE INDEX-MAPS.

These two maps serve to show the connection which exists between the different maps of the series. The Index-Maps are on the stereographic projection. The first, or Northern Index-Map, has the north pole as centre, and extends to 12 degrees south of the equator; the second, or Southern Index-Map, has the south pole as centre, and extends to 12 degrees north of the equator. Thus each includes six complete maps and parts of five others.

The Northern Index-Map has at the centre Map I., the north polar map of the series. Surrounding this are seen in order Maps II., IV., VI., VIII., and X. The circular boundaries of these maps in the Index-Map represent circles each equal to the circular boundary of Map I., but the scale-variation accruing with increase of distance from the

¹ Falling thus near the boundary of each map, the British Isles undergo the maximum distortion and variation of scale possible in the atlas. But there was an advantage even in this; for it serves to illustrate most effectively the slightness of the distortion in this atlas even where the distortion is at its maximum. Great Britain is widened in Map I., lengthened in Maps II. and X. Yet if the three pictures of the country in these maps are examined, it will be found that in none of them is the alteration of shape noticeable; while even if they are compared together, though that is equivalent to doubling the real difference (since the maximum widening takes place in I., and the maximum lengthening in Maps II. and X.), the variation of shape and scale still remains slight.

centre makes these maps show larger than Map I. Portions of Maps III., V., VII., IX., and XI. are also shown in widely extending arcs. Widely though these arcs extend, however, they represent circles no larger on the globe than the five circles fully shown, or than the small central polar circle.

The Southern Index-Map has at the centre Map XII., the south polar map of the series. Round this are seen in order Maps III., V., VII., IX., and XI., and round the circumference of the map are seen five widely spanning circular arcs representing parts of Maps II., IV., VI., VIII., and X. In this Index-Map, as in the other, all the map-boundaries represent (wholly or in part) circles of equal size on the globe.

The several maps included in the two Index-Maps are all numbered.

The Index-Maps are worth studying on their own account, and not only for the geographical but for the astronomical relations which they present. The hours named round the equator indicate the mean solar time on the corresponding meridians when it is mean noon at Greenwich.

The reader is reminded that longitude is now measured all over the world from the meridian of Greenwich, westwards and eastwards through 180 degrees, westerly longitude being regarded as positive, easterly longitude as negative. It would, perhaps, have been more consistent with the only relation involved—that of *time*—to have made easterly longitudes positive and westerly longitudes negative; since in places east of Greenwich the local time is Greenwich time *plus* the time corresponding to the easterly longitude, while in places west of Greenwich the local time is Greenwich time *minus* the time corresponding to the westerly longitude. But there is a way of viewing the matter which makes the accepted arrangement reasonable enough; for the time corresponding to the longitude

must be *added* to local time for places west of Greenwich, and subtracted from local time for places east of Greenwich to give Greenwich time.¹

MAP I.

This map presents the north polar regions as they have hitherto never been presented before, not only with the shapes of all the shore-lines undistorted and their true relative areas preserved, but with their relations to Europe, Asia, and North America shown to a much greater distance from the Pole than in any map (except the necessarily rough maps showing the whole northern hemisphere) yet, so far as I am aware, produced. Thus we can recognise the nature of journeys undertaken from British, Swedish, Danish, French, and German ports towards the North Pole, and can compare them with journeys from Siberian or North American ports. We perceive the similarity of the tasks undertaken by those on the one hand who strove to discover a north-west passage, and by those on the other who like Nordenskjold have made the north-eastern passage. The main current of the Arctic Ocean is seen to complete the entire circuit, but moving against the course of the north-western and with the course of the north-eastern travellers. Map I. shows well the relative extension of the Russian, British, American, and Swedish shores of the Arctic Ocean. It also indicates well the relation of the remote parts of Siberia, used as a penal region, to St. Petersburg, Moscow, and other parts of Russia where life is not passed under penal conditions. The ocean-currents shown in this map should be compared with those pictured in maps showing the oceanic currents

¹ By a strange oversight the reverse is (or was ?) indicated in the first edition of a little elementary treatise on Astronomy written by Mr. Christy, the present Astronomer Royal, for the Society for Promoting Christian Knowledge (probably this has been corrected in later editions).

on Mercator's projection. Noting that in this map the correct relations of these currents are presented, it will be seen how completely delusive Mercator's charts are so far as such features are concerned.

The overlaps of Map I. with Maps II., IV., VI., VIII., and X. should be carefully studied before passing to those several maps. Some of the principal uses of the atlas will be recognised when comparison is thus made between them, and especially the slightness of the distortion and scale-variation.

MAP II.

This map is chiefly remarkable as showing the North Atlantic for the first time in such a way that the relations of its shores can be recognised, from a point on the Brazil coast ten degrees south of the equator along the north coast of South America, round the West Indies from Trinidad to the Bahamas, along the shores of North America, from Cape Fear past Capes Hatteras, Cod, Sable, and Race, round Newfoundland and Labrador, thence to Greenland, and so (crossing a part where the Atlantic and Arctic Oceans meet, shown in Map I.) by the British Isles, France, and Spain, to the shores of Africa from Tangier by Capes Blanco and Verd and Liberia to the Gulf of Guinea. The shortest journey from any port shown in the map to any other may be shown very nearly by drawing straight lines, the meridians in the map, which all (being great circles) represent such routes, showing just how much curvature is introduced by the method of projection.¹

¹ By noting this, even the slight difference between the straight line and the shortest route can be corrected in one of these maps. Suppose, for instance, the student or traveller wishes to find and pencil in the shortest route from Sierra Leone to Trinidad. He measures the distance of each place from the map's edge. Then with a compass opened to the linear distance between the two places he sets the compass-points so that, while on a meridian (not necessarily one actually shown in the map), one shall be as far from the

Before passing to Map III. the student should observe the portion of South America within that fifth part of the frame (the lower left-hand portion) outside which Map III. is marked in. The whole of this portion of South America is shown in Map III. The overlap with Map IV. should also be examined.

MAP III.

This map shows the whole of South America, and may be described as the first map of that whole continent that has been shown on a central projection.

A portion of the Pacific Ocean very seldom shown (separately and undistorted) in maps appears in Map III. The great current of the eastern part of the South Pacific forms an interesting feature of this sea-tract.

Before turning to Map IV. the student should note the portion of the map bordering on and overlapping that map. The part of Map III. overlapping Map V. should also be studied before passing to the last-named map.

MAP IV.

This map shows nearly the whole of North America, the parts not shown being Labrador on the east and Alaska on the west. The extent of the United States can

edge of the map as Sierra Leone is, the other as far from the edge as Trinidad is. The meridian connecting the compass-points, which can be readily drawn on tracing paper with the guidance of the actually mapped meridians to indicate its shape, gives the shape of the path which is the shortest route between the two places. All that is necessary now is to shift the tracing paper with the curved path thus drawn upon it till Sierra Leone is under one end of the pencilled path, and Trinidad under the other, the convexity of the curve being of course set outwards or towards the boundary of the map.

In my 'Shortest Sea Routes' the drawing of shortest routes is more fully explained. For cases where long journeys have to be dealt with, the present maps are necessarily insufficient.

be well perceived by comparing Map IV. with Map II., where Great Britain, France, and Spain are shown on the same scale, or with Map X., where the greater part of Europe is similarly presented. The eastern part of the Northern Pacific and its great system of circling currents is shown correctly proportioned in Map IV., in which also a large portion of the equatorial Pacific current is depicted.

It will be desirable to study the parts of Map IV. overlapping Maps V. and VI. before turning to these, though the overlaps here (the only such case in the atlas) show no definite landmarks by which the teachings of one map can be combined with those of the two others. The currents and the meridians and parallels are all that avail for the direct comparison. But the student should turn back to Map III., and study the part of it overlapping Map V.

MAP V.

In this map the greater portion of the South Pacific and a part of the Southern Ocean are shown. The relative positions of New Zealand, the Fijis, and Low Islands Archipelago are indicated more satisfactorily than heretofore, and by comparing the overlaps between Map III. and Map V., the positions of all these regions with respect to the shores of South America can be clearly recognised.

But Map V. is chiefly interesting as illustrating (in connection with Map III.) the system of currents in the South Pacific.

The overlaps with Maps VI. and VII. should be examined by the student before leaving Map V.

MAP VI.

In this map the North Pacific is shown from longitude 140° west on the east to Japan, the Ladrones, and the Caroline Islands on the west (the range in longitude on that side running from as far east of Greenwich as on the other side the range in longitude runs from west of Greenwich), from

the Aleutians on the north to the Ellice Islands on the south. The position of the Sandwich Isles with reference to the shores of North America can be recognised by noting that Hawaii lies in latitude 20° , about 5° in longitude outside the overlap of Map IV. The positions of all the island groups, with respect to Kamschatka and Japan, shown in the chart are clearly indicated.

The overlaps between Map VI. and Maps VII. and VIII. should be carefully studied before passing to these.

MAP VII.

Map VII. presents the whole of Australasia, with much wider tracts of the surrounding waters than are commonly shown, except in maps of hemispheres and the still more deceptive Mercator's charts. The relative area of Australia and other land-regions can be recognised by turning from Map VII. to others. We see also in Map VII. the nature of the sea-journeys by which so much of the communication between different parts of Victoria, New South Wales, and South Australia is conducted ; and can compare with these the journeys between Australia, Tasmania, and New Zealand, as well as the journeys between different ports of the New Zealand islands. The student will find it interesting to examine the East Indian islands included in this map, and to note their relations with Australia, with the Solomon Isles, New Hebrides, New California, and the Fijis, and with the Pelew and Caroline Islands. The ocean-currents in this map also deserve careful study.

Before passing from Map VII. the student should examine its overlaps with Maps VIII. and IX.

MAP VIII.

This map shows more land than any other in the series, except Map X. It gives in full the Chinese Empire, the Japanese Islands, India, Burmah, and Siam ; shows the chief portion of Asiatic Russia in its northern portion, and

the East Indian Islands from Sumatra to New Guinea (only a small part of which is seen) in the southern. A comparison of the areas shown in this map with those shown in others, and especially with those shown in Maps III., IV., VII., and X., will be found instructive, and will tend to correct false impressions which are apt to be suggested by the usual arrangement of atlas-maps. The British student will find it interesting to study here the position of the countries bordering on our Indian Empire.

The overlaps between Map VIII. and Maps IX. and X. should be carefully studied before passing to these two maps.

MAP IX.

In this map the Indian Ocean is shown as it has never before been mapped. By a happy chance the position of the principal lands bordering this ocean are just indicated. On the east we see Sumatra and Australia (Shark's Bay), on the north Cape Comorin and Ceylon; on the west Madagascar and the coast of Africa, from Port Natal to Zanzibar, mark the extension of the Indian Ocean on that side. In the lower part of the map we see the Southern Ocean, and can note (here, I think, for the first time in an undistorted map) the relative positions of the Crozets, Kerguelen Island, St. Paul's Island, Amsterdam Island, and other places about which I raised such a pother (to some successful purpose, however) in regard to the Transit of Venus in 1874. Perhaps some will be more interested to note the correct mapping here of St. Paul's Island as a spot which plays a most interesting part in Mr. W. Clark Russell's capital story, 'Jack's Courtship.'

The overlaps between Map IX. and Maps X. and XI. should be carefully examined before the student passes to these two maps.

MAP X.

Map X. is nearly all land. It shows all Europe, except the northern parts of Sweden and Russia. In Asia, India is partly shown, the overlap for Map VIII. bringing into view the important portion of the Indian Empire bordering on Afghanistan and Beluchistan. Persia, Asia Minor, and Arabia appear in full. In Africa the whole of the regions where European interests have been at stake, both towards the east (Egypt, Nubia, Abyssinia, and the Soudan) and towards the west (Morocco, Algeria, and Tunis), are seen in their true geographical relations with respect to Europe and the eastern parts of Asia.

Map X. includes nearly the whole of the overland route to India ; all, in fact, from England to the Indian Ocean. It is also interesting as presenting the region around the centres of ancient civilisation in Egypt, Greece, Mesopotamia, and Palestine. In fact, except for a part of India (belonging to Map VIII.) on the extreme east, and a small portion of Africa (belonging to Map II.) on the extreme west, Map X. presents the whole of the Old World as known to the ancient Egyptians, Greeks, and Romans. This interesting area of the earth's surface has not before been shown on a central projection, such that all directions and distances from the mid-region are correctly represented. The actual centre of this map is about 200 miles south-east of Mount Sinai, and almost equidistant from Jerusalem (southwards), and from the Great Pyramid towards the north-east.

The overlaps for Maps XI. and II. should be carefully examined.

MAP XI.

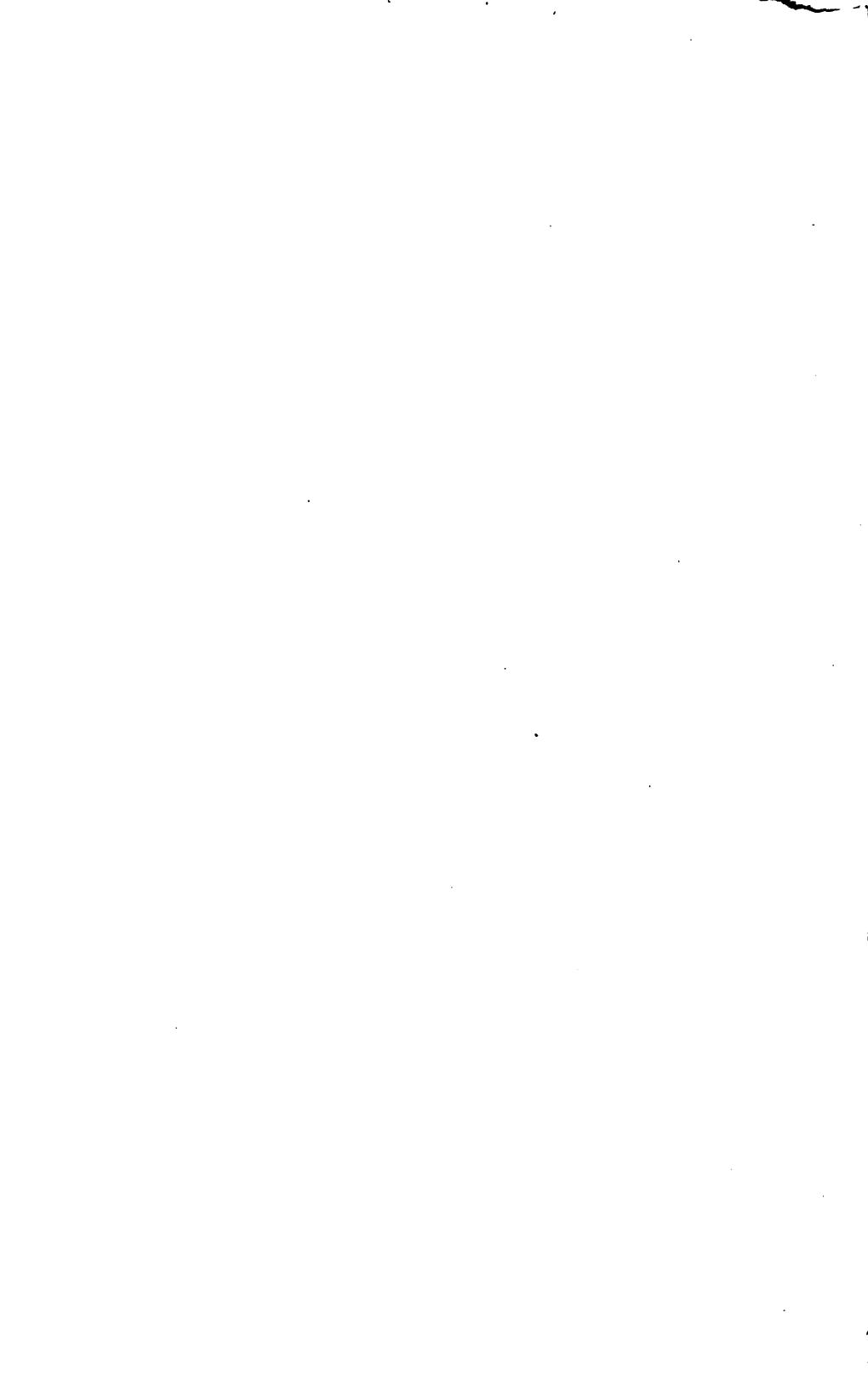
Map XI. is chiefly interesting as showing the greater part of the South Atlantic, and indicating the extension of this ocean between the western shores of Southern Africa and the eastern coast of South America, which just extends

within the boundary at the part of the coast of Brazil north of latitude 20° south. Between Maps XI., II., and III., the extent and configuration of the Atlantic Ocean, and the nature of the currents traversing it, can be clearly recognised. Maps II. and XI. include the tracks traversed by vessels passing from European ports to or round the Cape, while Maps II. and III. include those for journeys from European ports to the eastern shores of South America and round Cape Horn.

MAP XII.

This map should be first carefully compared with the overlaps for Maps III., V., VII., IX., and XI. Tierra del Fuego (or, more strictly, the extreme south of Patagonia) is the only portion of any continent extending into this Antarctic map, which presents in this respect a singular contrast with Map I. Very little is known of the region within the Antarctic circle; the currents shown within that region in Map XII. are mapped for the most part rather from inference than from exact observation, having only been crossed here and there by Antarctic travellers, and in a few cases indicated by the movements of floating bodies. It will be observed that the chief currents of Antarctic seas circuit the south polar regions from east to west, whereas the chief currents of the Arctic seas circuit the north polar regions from west to east.

NOTE.—*On the back of each map the number of the map and the chief contents are indicated separately (on each half). [It would be convenient if this were done in all atlases.]*



MAP I

**NORTHERN REGIONS, ARCTIC OCEAN, BRITISH ISLES,
NORTHERN EUROPE, NORTHERN ASIA, ALASKA,
AND THE DOMINION OF CANADA.**

MAP I.

HIGH NORTHERN LATITUDES

by Richd. A. Proctor.

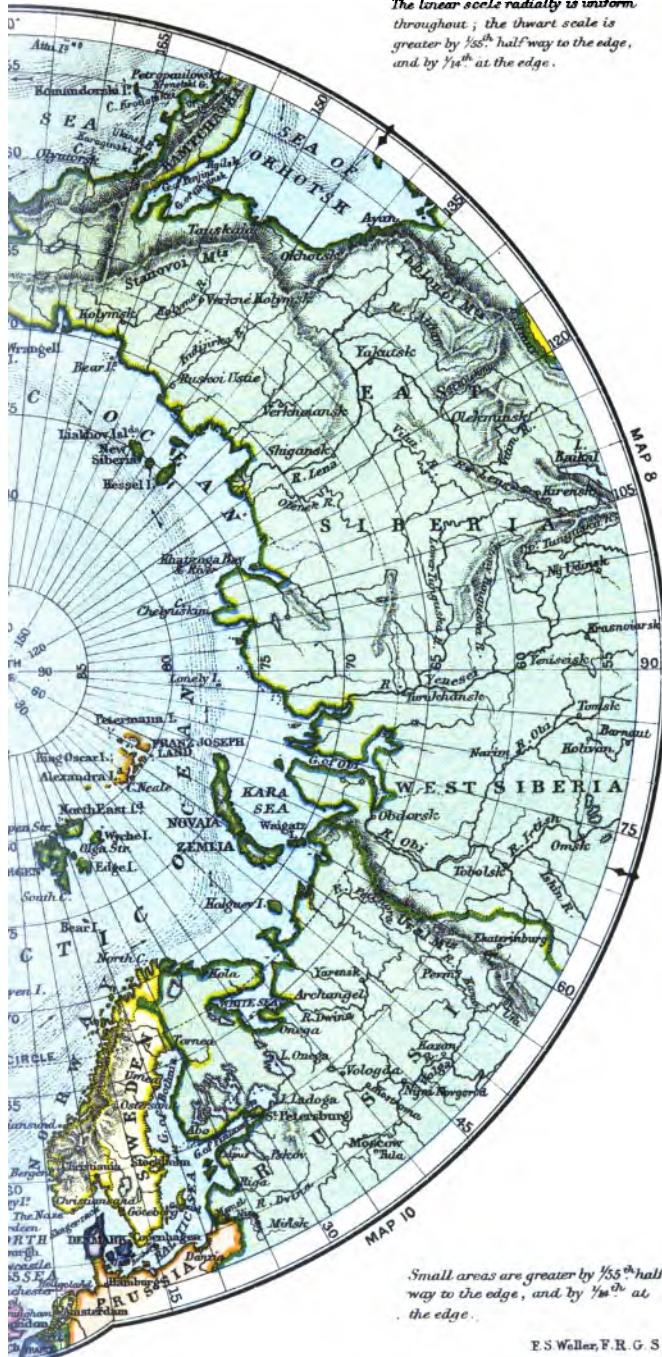


Scale of Miles at centre of map
and radially all over map.
English Miles.

0 50 100 200 400 600 800 1000

London, Lon

The linear scale radially is uniform throughout; the thwart scale is greater by $\frac{1}{55}^{\text{th}}$ half-way to the edge, and by $\frac{1}{14}^{\text{th}}$ at the edge.



Small areas are greater by $\frac{1}{55}^{\text{th}}$ half way to the edge, and by $\frac{1}{46}^{\text{th}}$ at the edge.

F. S. Waller, F.R.G.S.

MAP I

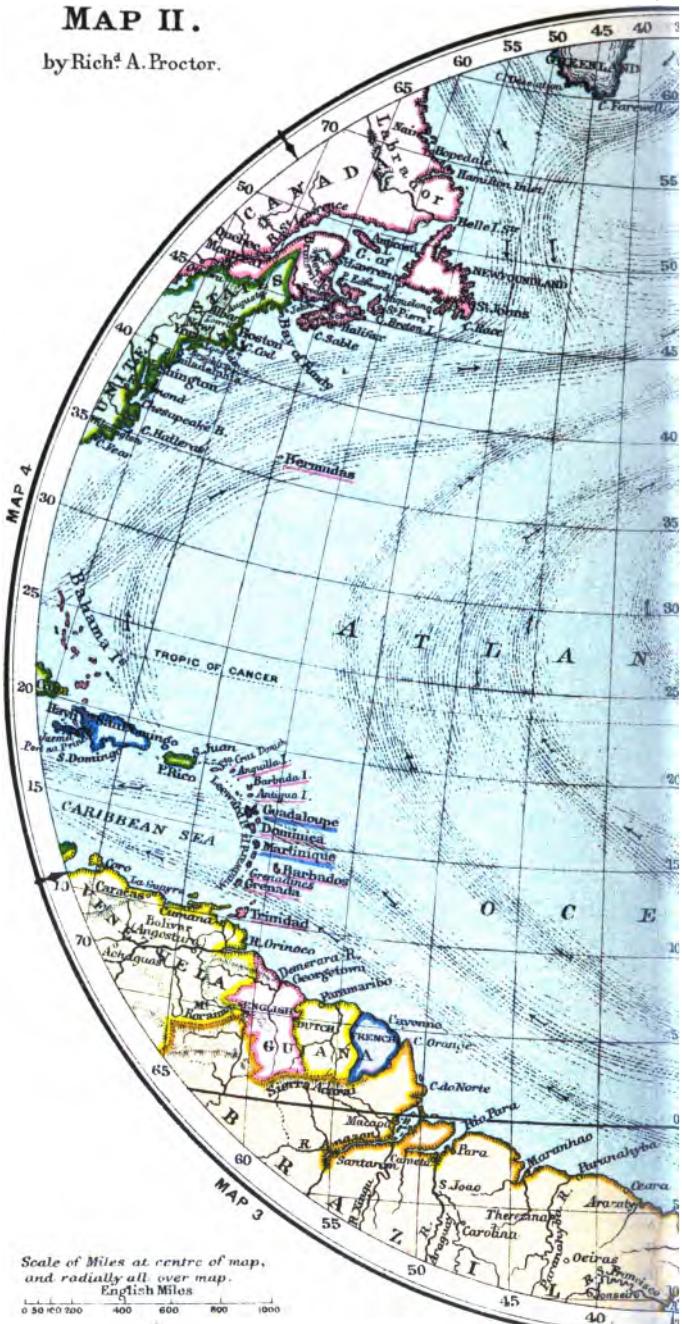
**NORTHERN REGIONS, ARCTIC OCEAN, BRITISH ISLES,
NORTHERN EUROPE, NORTHERN ASIA, ALASKA,
AND THE DOMINION OF CANADA.**

MAP II

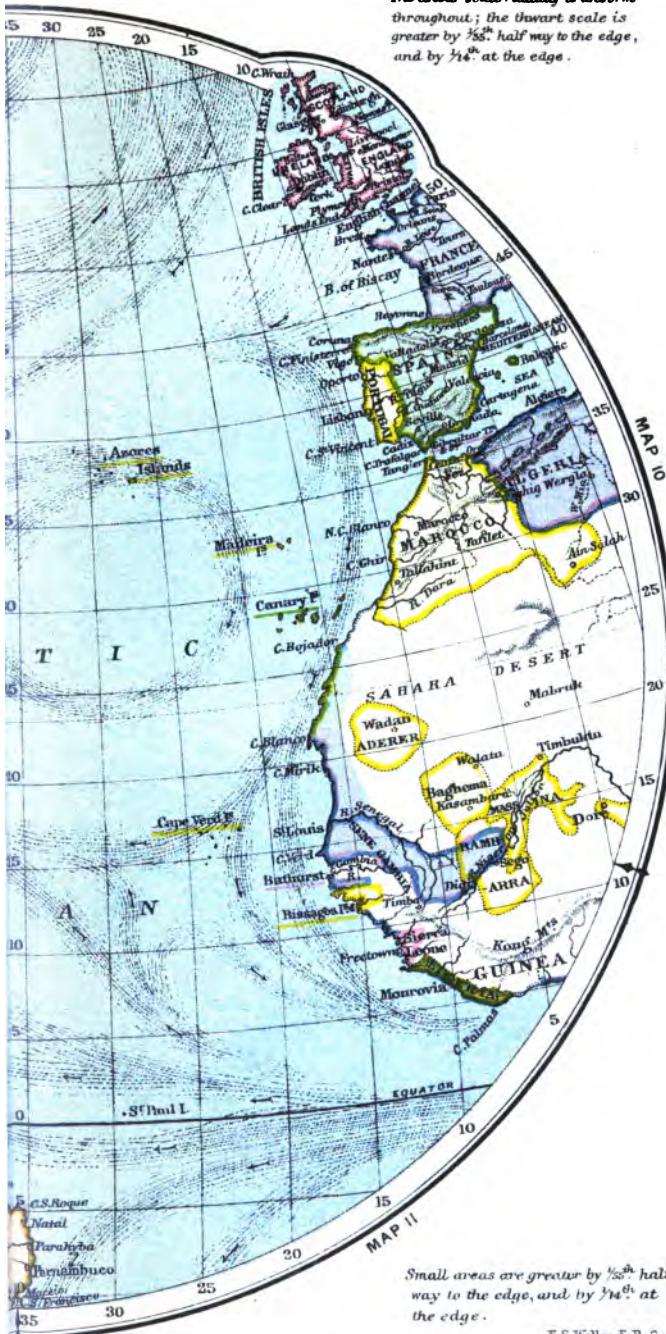
**NORTH ATLANTIC, BRITISH ISLES,
FRANCE, SPAIN, NORTHWESTERN AFRICA,
EASTERN SHORES OF NORTH AMERICA,
AND NORTH-EAST OF SOUTH AMERICA.**

MAP II.

by Rich^d A. Proctor.



The linear scale radially is uniform throughout; the Stewart scale is greater by $\frac{1}{58}$ th half way to the edge, and by $\frac{3}{14}$ th at the edge.



MAP II

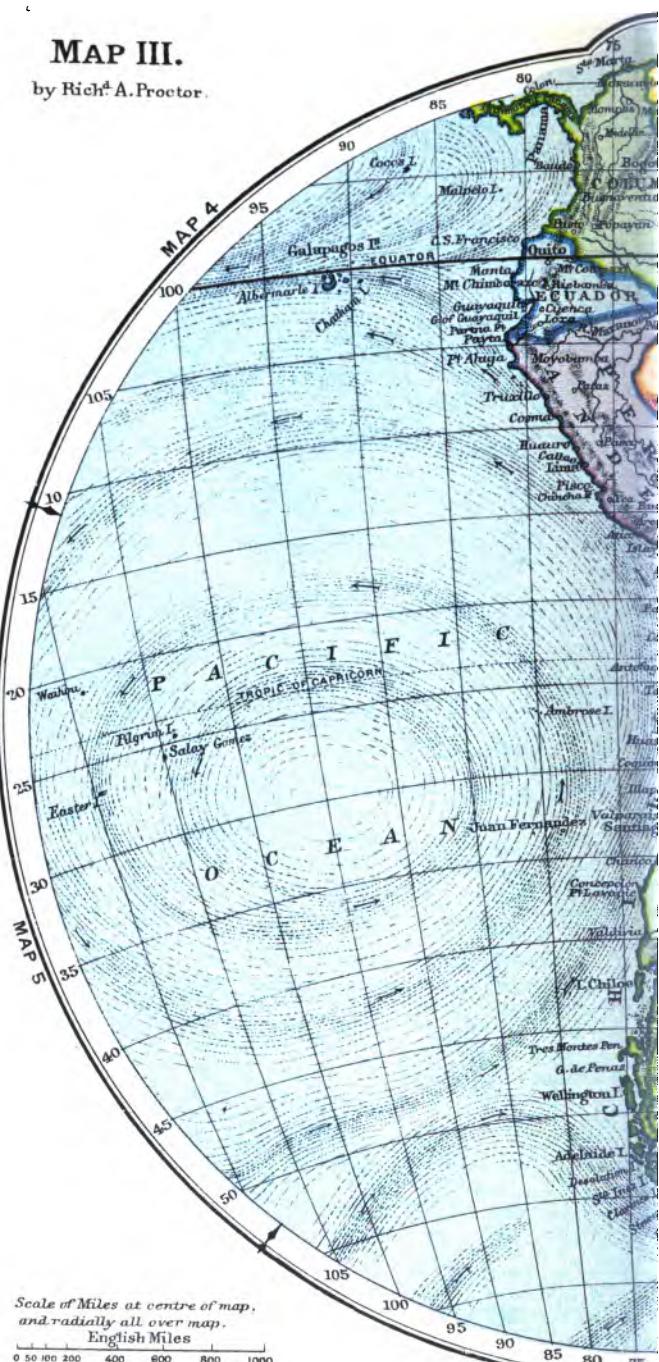
**NORTH ATLANTIC, BRITISH ISLES,
FRANCE, SPAIN, NORTHWESTERN AFRICA,
EASTERN SHORES OF NORTH AMERICA,
AND NORTH-EAST OF SOUTH AMERICA.**

MAP III

**SOUTH WESTERN ATLANTIC,
AND SOUTH-EASTERN PACIFIC.**

MAP III.

by Rich^d. A. Proctor.



*Scale of Miles at centre of map,
and radially all over map.*

English Miles

London, Long

The linear scale radially is uniform throughout; the Gauri scale is greater by $\frac{1}{32}$ at half way to the edge, and by $\frac{1}{16}$ at the edge.



Small areas are greater by $\frac{1}{32}$ at half way to the edge, and by $\frac{1}{16}$ at the edge.

F. S. Weller, F.R.G.S.

MAP III

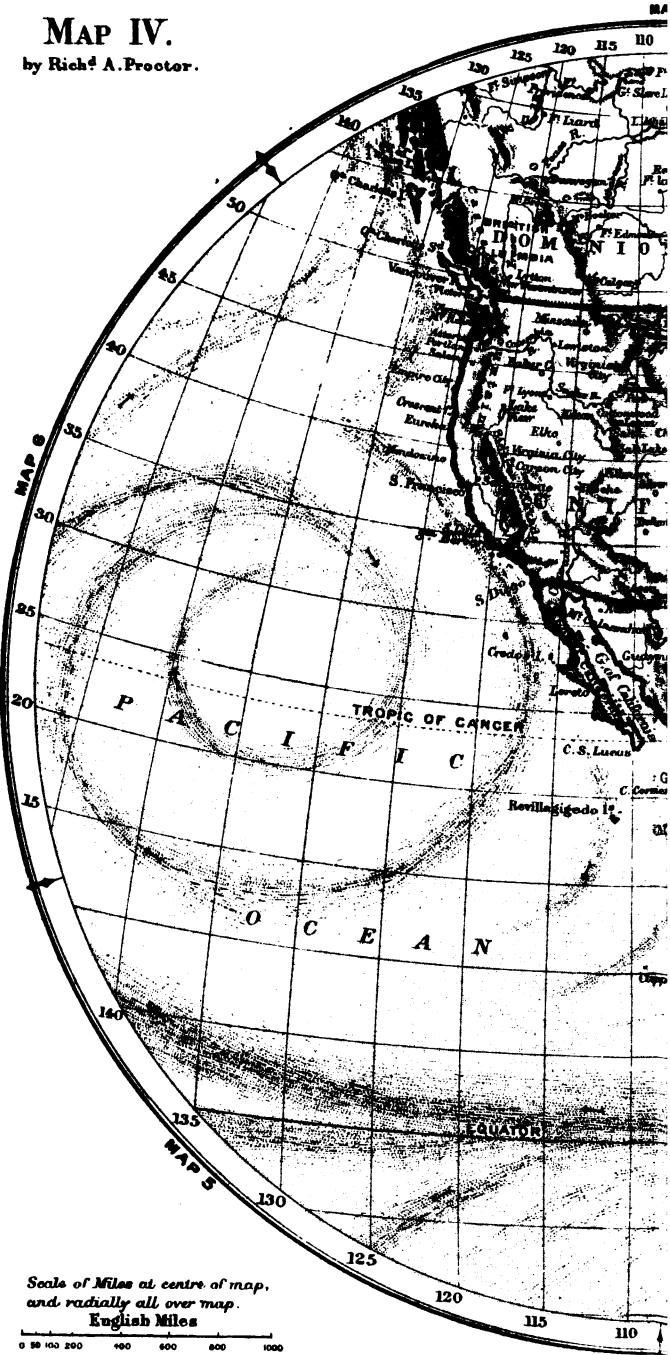
**SOUTH WESTERN ATLANTIC,
AND SOUTH-EASTERN PACIFIC.**

MAP IV

**UNITED STATES, DOMINION OF CANADA,
CENTRAL AMERICAN STATES, MEXICO, THE WEST INDIES,
SOUTH-EASTERN PACIFIC.**

MAP IV.

by Richd A. Proctor.



Scale of Miles at centre of map,
and radially all over map.

English Miles

0 50 100 200 400 600 800 1000

London, Lon-



F. S. Weller, F.R.G.S.

MAP IV

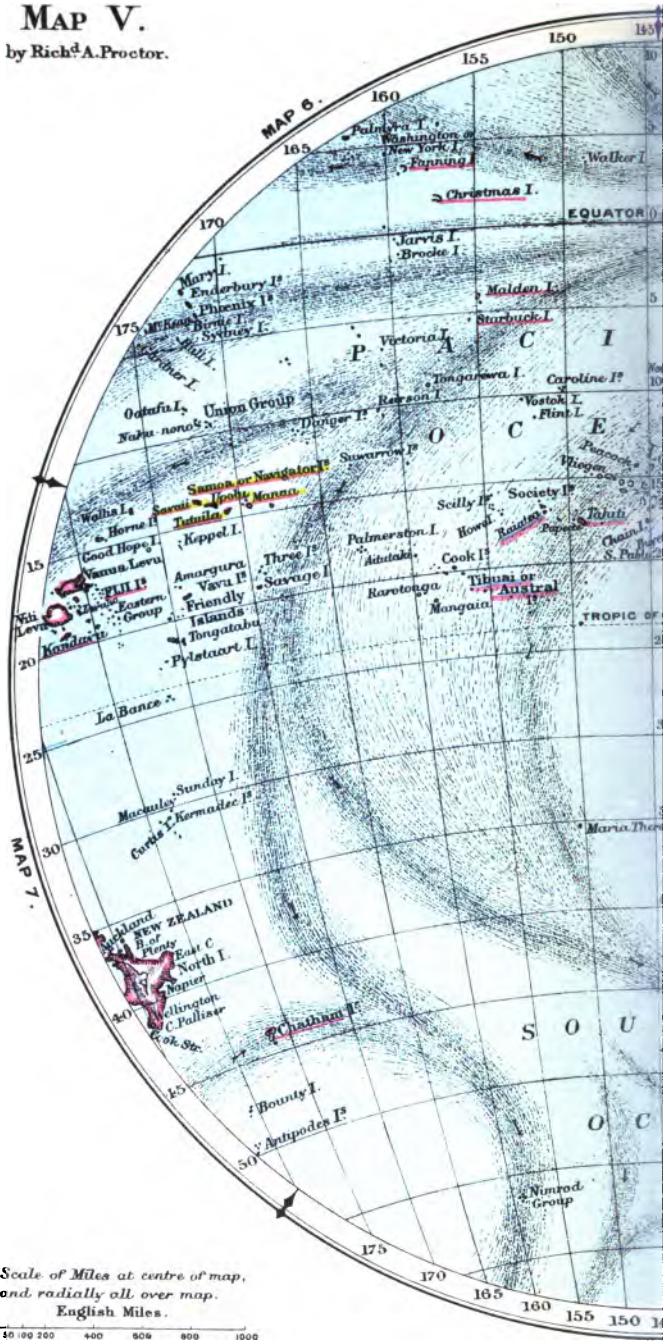
**UNITED STATES, DOMINION OF CANADA,
CENTRAL AMERICAN STATES, MEXICO, THE WEST INDIES,
SOUTH-EASTERN PACIFIC.**

MAP V

**SOUTHERN PACIFIC, NEW ZEALAND (NORTH IS.)
FIJI IS., LOW ISLANDS ARCHIPELAGO,
AND SOUTHERN OCEAN.**

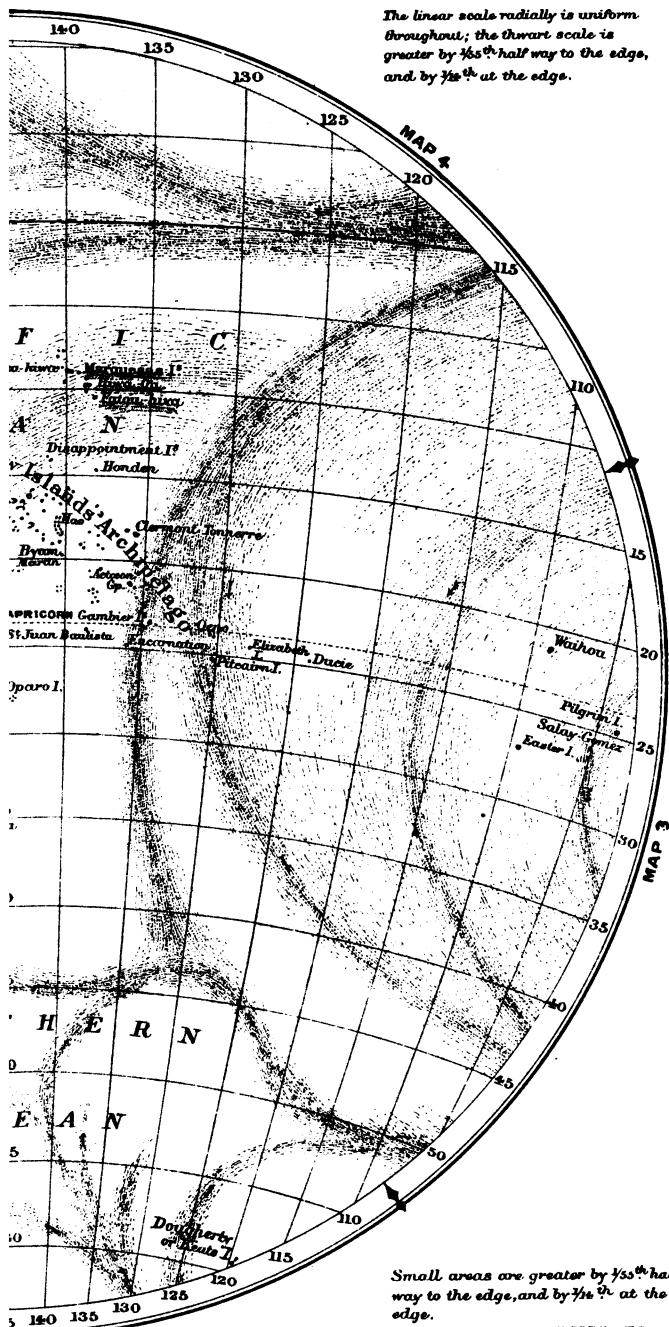
MAP V.

by Richd A. Proctor.



London, L.

The linear scale radially is uniform throughout; the thwart scale is greater by $\frac{1}{65}^{\text{th}}$ half way to the edge, and by $\frac{1}{13}^{\text{th}}$ at the edge.



F. S. Waller, F.R.G.S.

MAP V

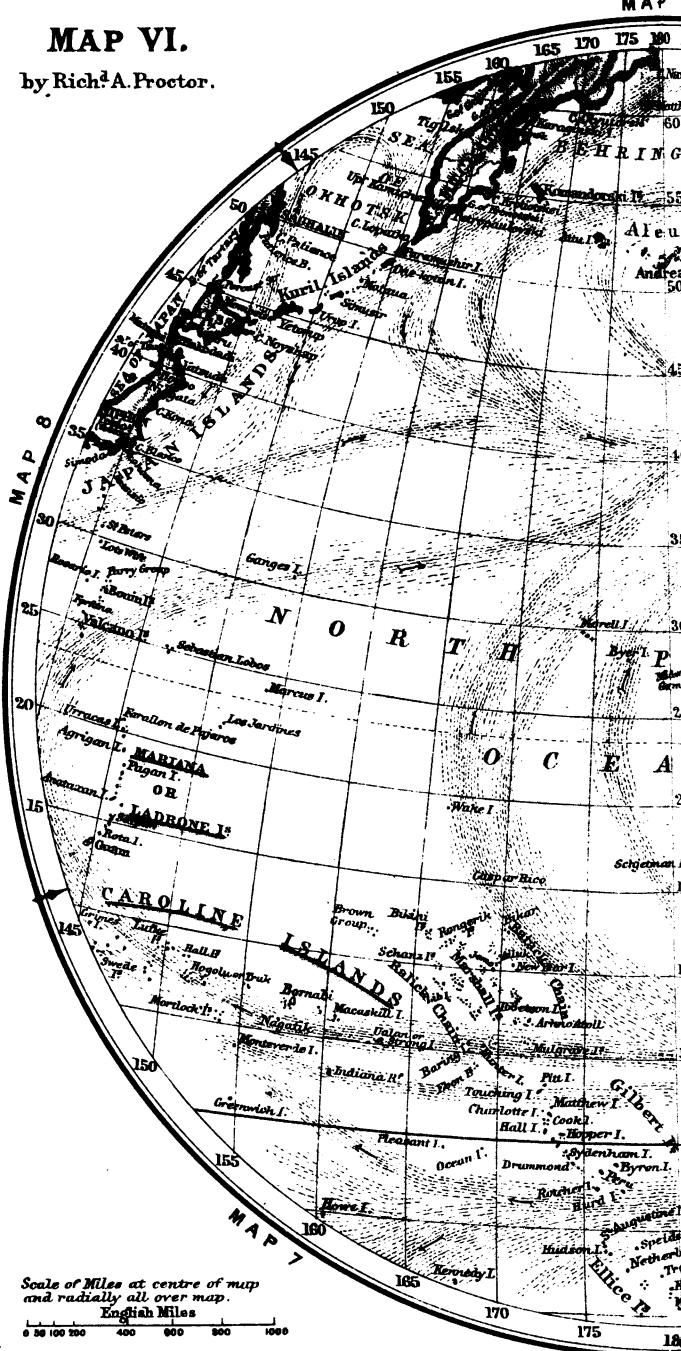
**SOUTHERN PACIFIC, NEW ZEALAND (NORTH 19)
FIJI 19, LOW ISLANDS ARCHIPELAGO,
AND SOUTHERN OCEAN.**

MAP VI

**NORTHERN PACIFIC, SANDWICH IS., ALASKA, KAMSCHATKA,
JAPAN, LADRONE IS., AND CAROLINE IS.**

MAP VI.

by Rich^d. A. Proctor.



*Scale of Miles at centre of map
and radially all over map.*

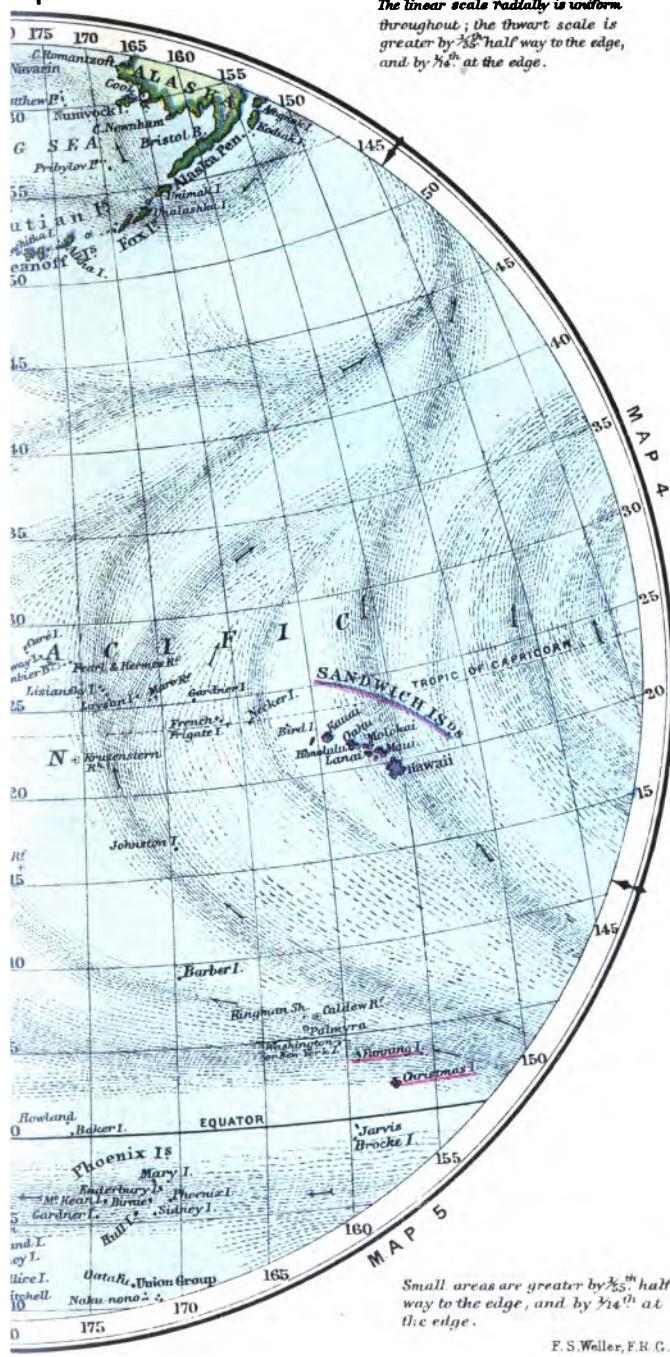
all over English Miles

MILEAGE MILES

0 100 200 300 400 500 600 700 800 900 1000

London, Lon

The linear scale radially is uniform throughout; the thwart scale is greater by $\frac{1}{55}^{\text{th}}$ half way to the edge, and by $\frac{1}{4}^{\text{th}}$ at the edge.



Small areas are greater by $\frac{2}{55}^{\text{th}}$ half way to the edge, and by $\frac{1}{14}^{\text{th}}$ at the edge.

F. S. Weiller, F.R.G.S.

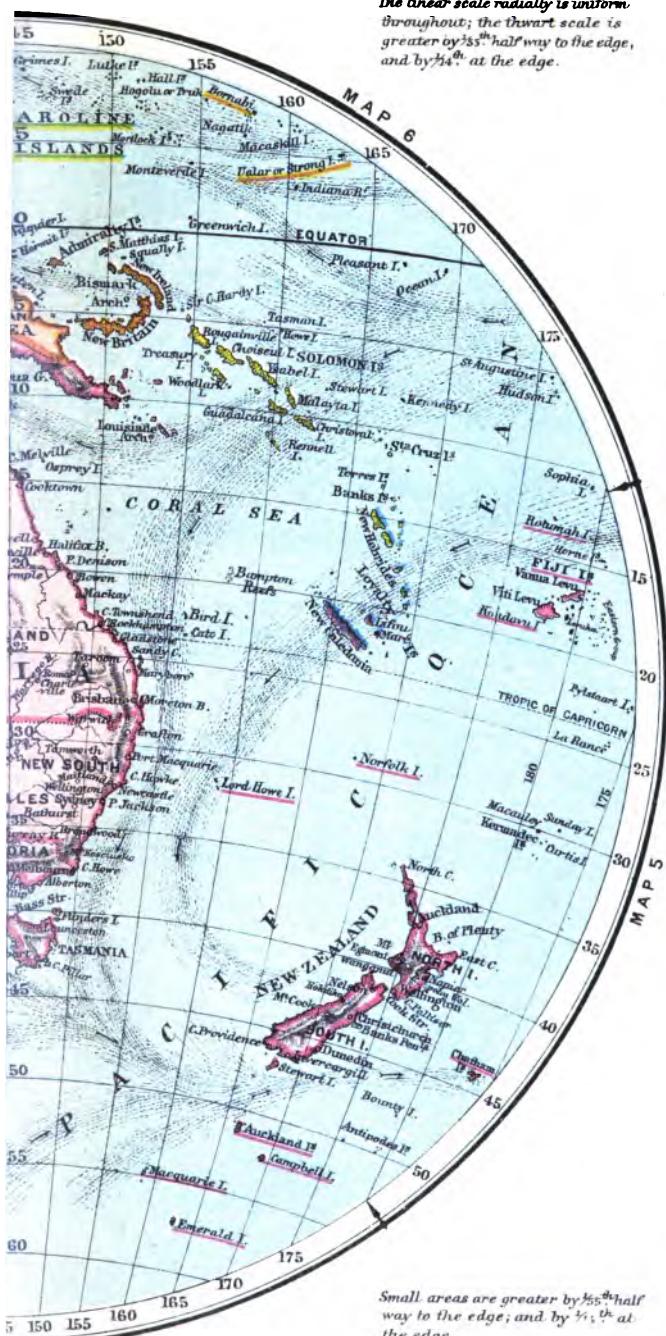
MAP VI

**NORTHERN PACIFIC, SANDWICH IS., ALASKA, KAMSCHATKA,
JAPAN, LADRONE IS., AND CAROLINE IS.**

MAP VII

**CELEBES, NEW GUINEA, SOLOMON IS., AUSTRALIA,
TASMANIA, NEWZEALAND, AND SOUTHWESTERN PACIFIC**

The linear scale radially is uniform throughout; the dwarf scale is greater by $\frac{1}{55}$ th half way to the edge, and by $\frac{1}{4}$ th at the edge.



F. S. Waller, F.R.G.S.

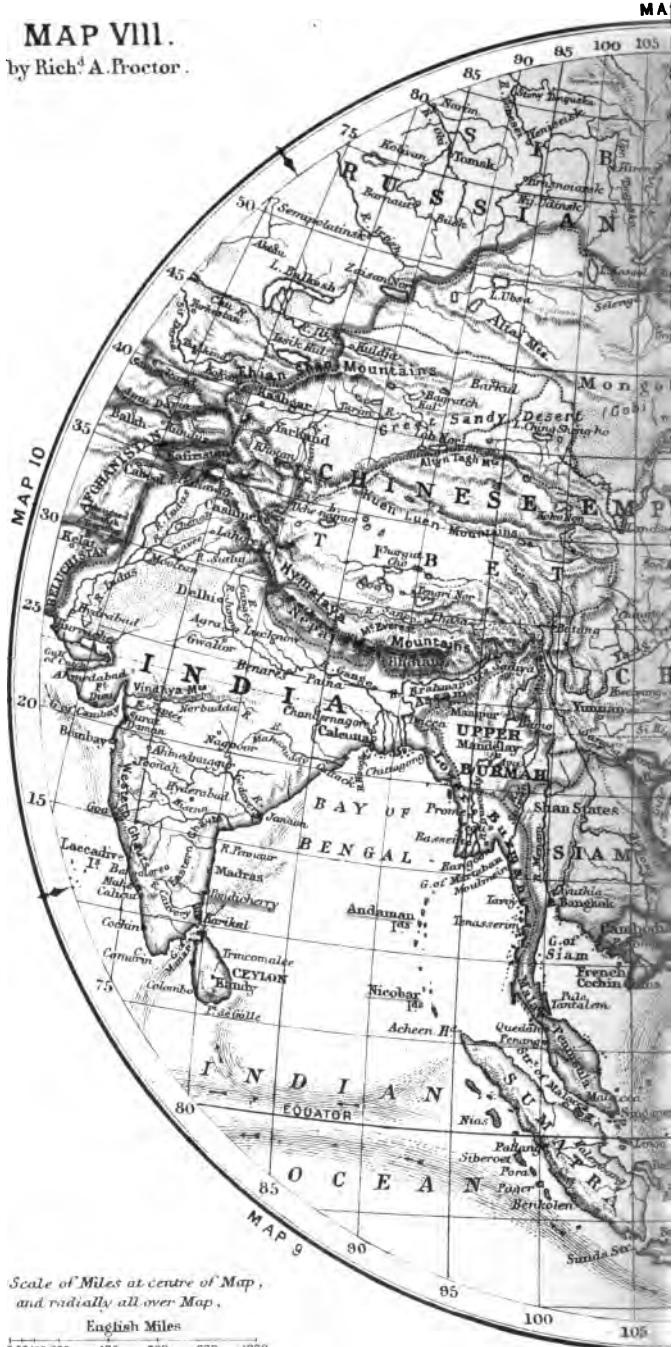
MAP VII

**CELEBES, NEW GUINEA, SOLOMON IS., AUSTRALIA,
TASMANIA, NEWZEALAND, AND SOUTHWESTERN PACIFIC**

MAP VIII

**ASIA, SIBERIA, CHINESE EMPIRE, INDIA, BURMAH,
SIAM, PHILIPPINE IS., SUMATRA, BORNEO, CELEBES,
JAVA, AND SOUTHWESTERN PACIFIC.**

MAP VIII.
by Rich^d. A. Proctor.



The linear scale radially is uniform throughout; the thwart scale is greater by $\frac{1}{35}$ th half-way to the edge and by $\frac{1}{34}$ th at the edge.



F. S. Waller, F.R.G.S.

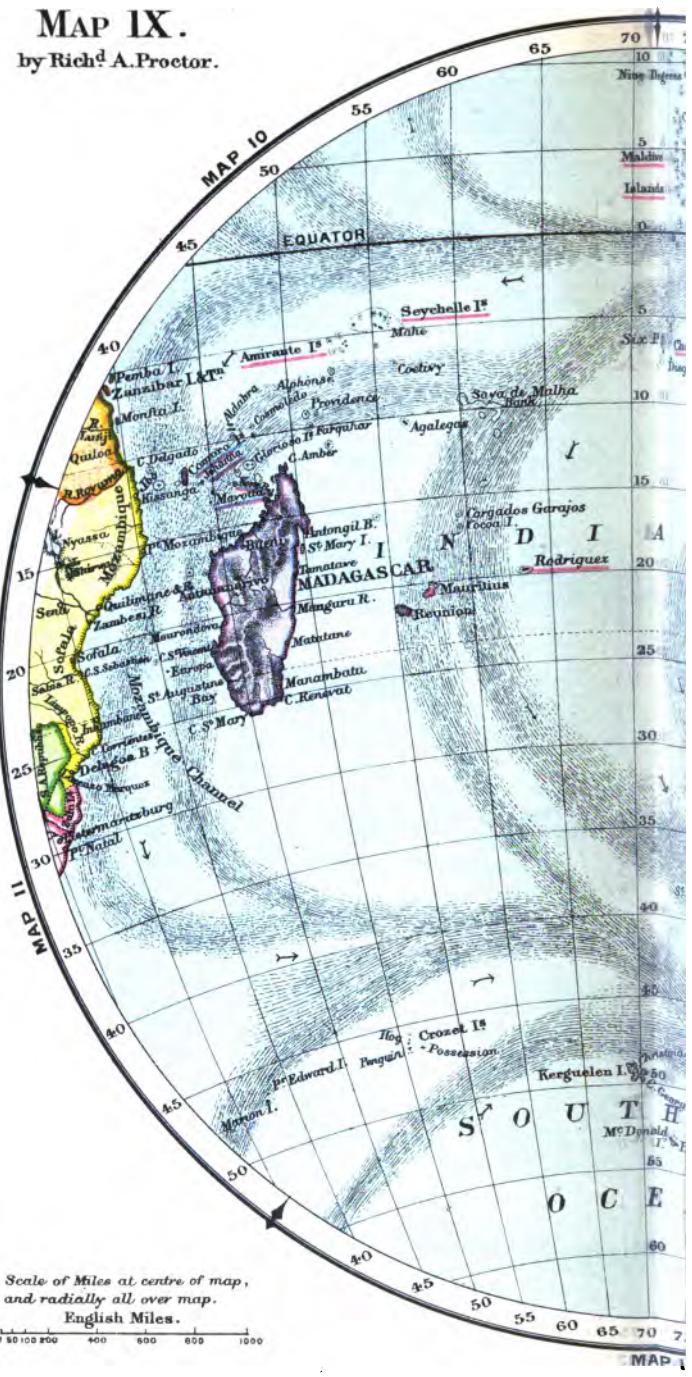
MAP VIII

**ASIA, SIBERIA, CHINESE EMPIRE, INDIA, BURMAH,
SIAM, PHILIPPINE IS., SUMATRA, BORNEO, CELEBES,
JAVA, AND SOUTHWESTERN PACIFIC.**

MAP IX

*INDIAN OCEAN, SOUTHERN OCEAN, CEYLON, MADAGASCAR,
AND SOUTHEASTERN SHORES OF AFRICA.*

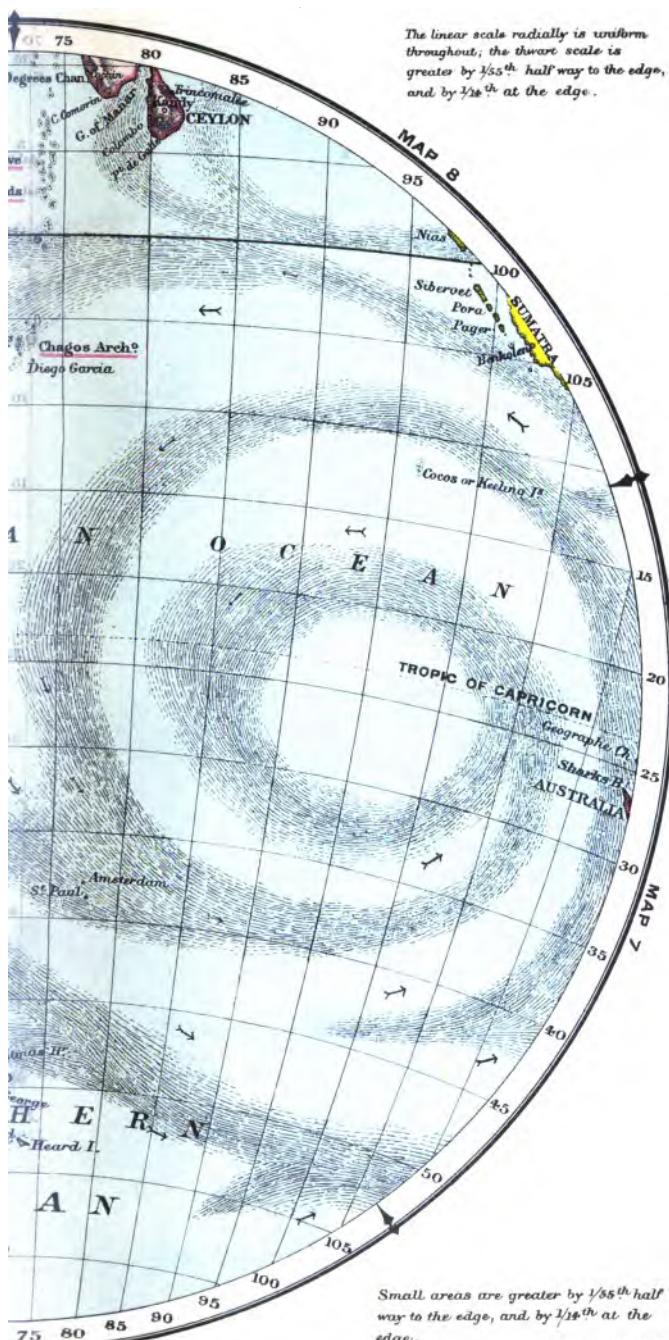
MAP IX.
by Rich^d A. Proctor.



*Scale of Miles at centre of map,
and radially all over map.*

English Miles.

London, Longm



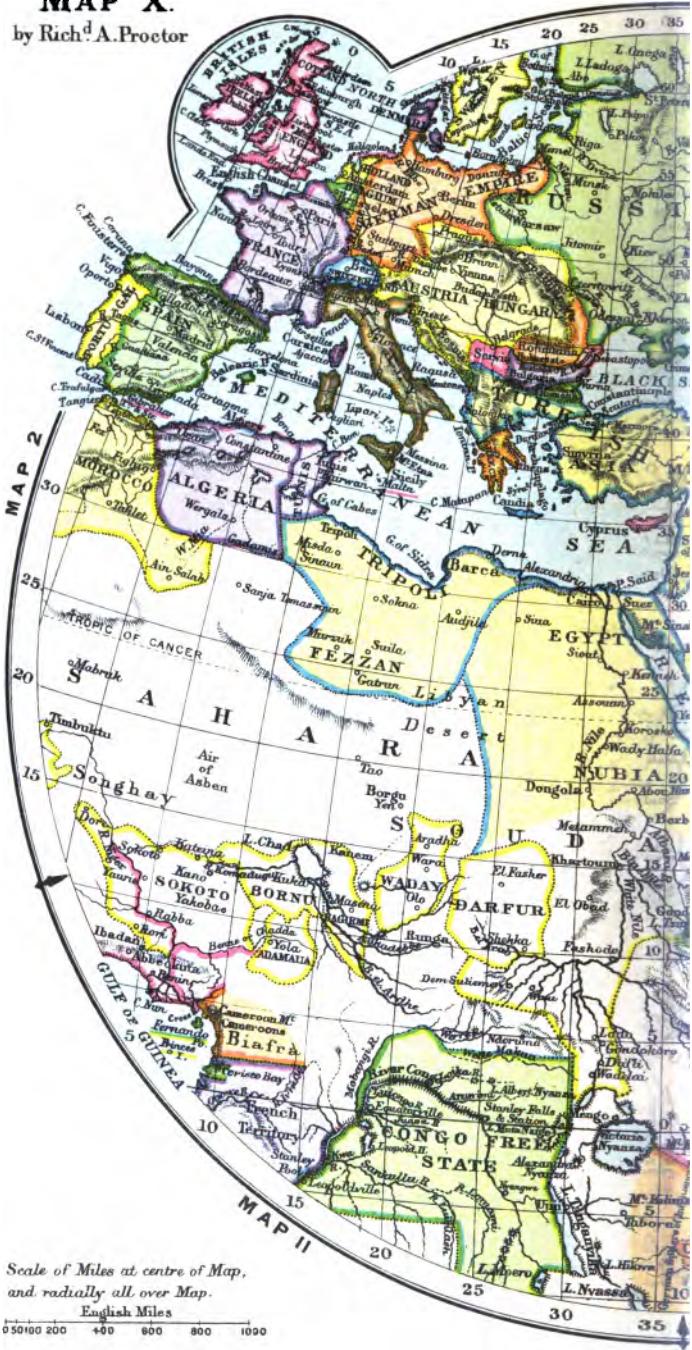
MAP IX

**INDIAN OCEAN, SOUTHERN OCEAN, CEYLON, MADAGASCAR,
AND SOUTHEASTERN SHORES OF AFRICA.**

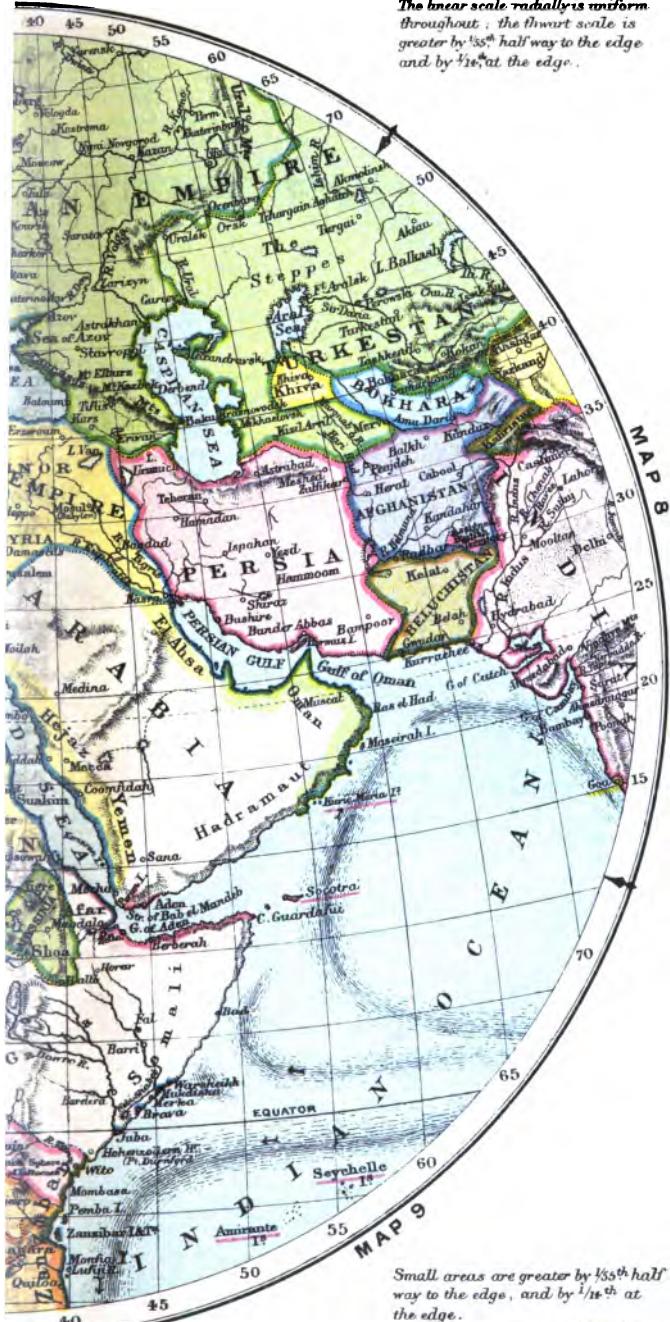
MAP X

**BRITISH ISLES, FRANCE, GERMANY, AUSTRIA,
RUSSIA, SPAIN, ITALY, TURKISH EMPIRE, TURKESTAN,
AFGHANISTAN, BELUCHISTAN, PERSIA, ARABIA,
MEDITERRANEAN, NORTH AFRICA, SOUDAN, SAHARA,
ZANZIBAR, AND NORTHWESTERN INDIAN OCEAN.**

MAP X.
by Rich^dA. Proctor



The linear scale radially is uniform throughout: the thwart scale is greater by $\frac{1}{33}$ th half-way to the edge and by $\frac{1}{16}$ th at the edge.



F. S. Weller, F.R.G.S.

MAP X

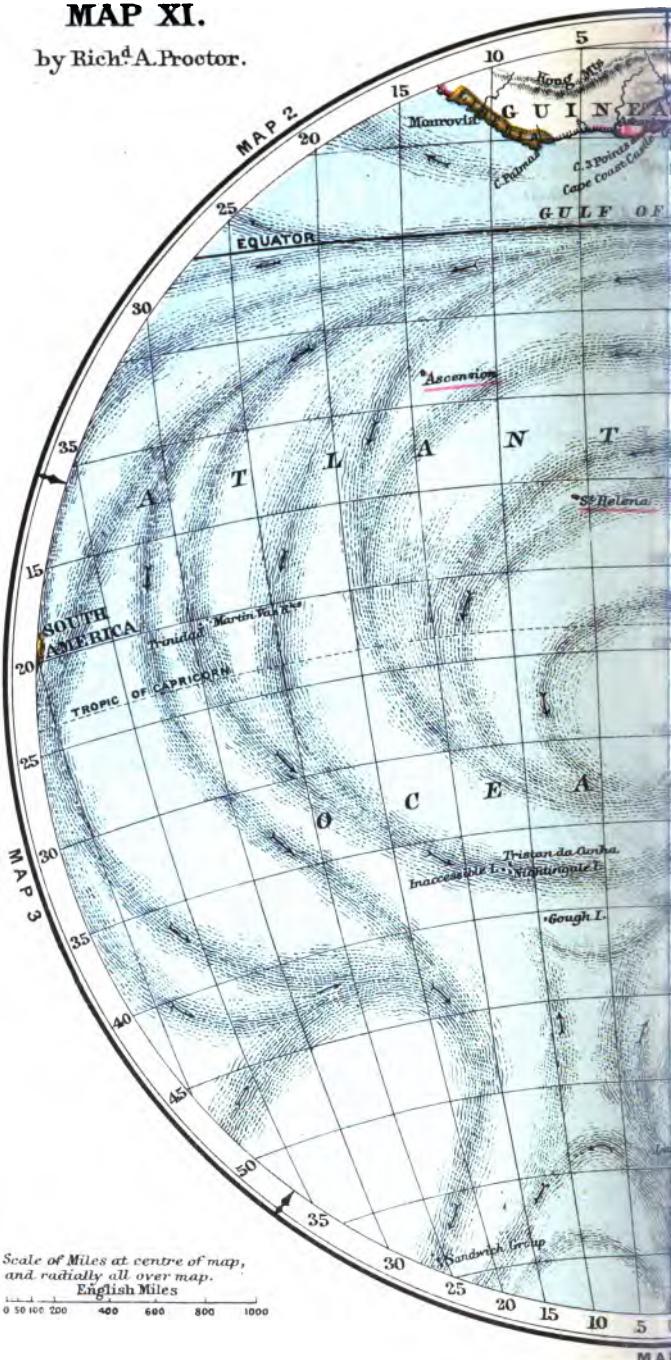
**BRITISH ISLES, FRANCE, GERMANY, AUSTRIA,
RUSSIA, SPAIN, ITALY, TURKISH EMPIRE, TURKESTAN,
AFGHANISTAN, BELUCHISTAN, PERSIA, ARABIA,
MEDITERRANEAN, NORTH AFRICA, SOUDAN, SAHARA,
ZANZIBAR, AND NORTHWESTERN INDIAN OCEAN.**

MAP XI

**GUINEA, SOUTHERN AFRICA, CONGO, BECHUANA,
CAPE COLONY &c. AND SOUTHERN ATLANTIC.**

MAP XI.

by Rich^dA. Proctor.

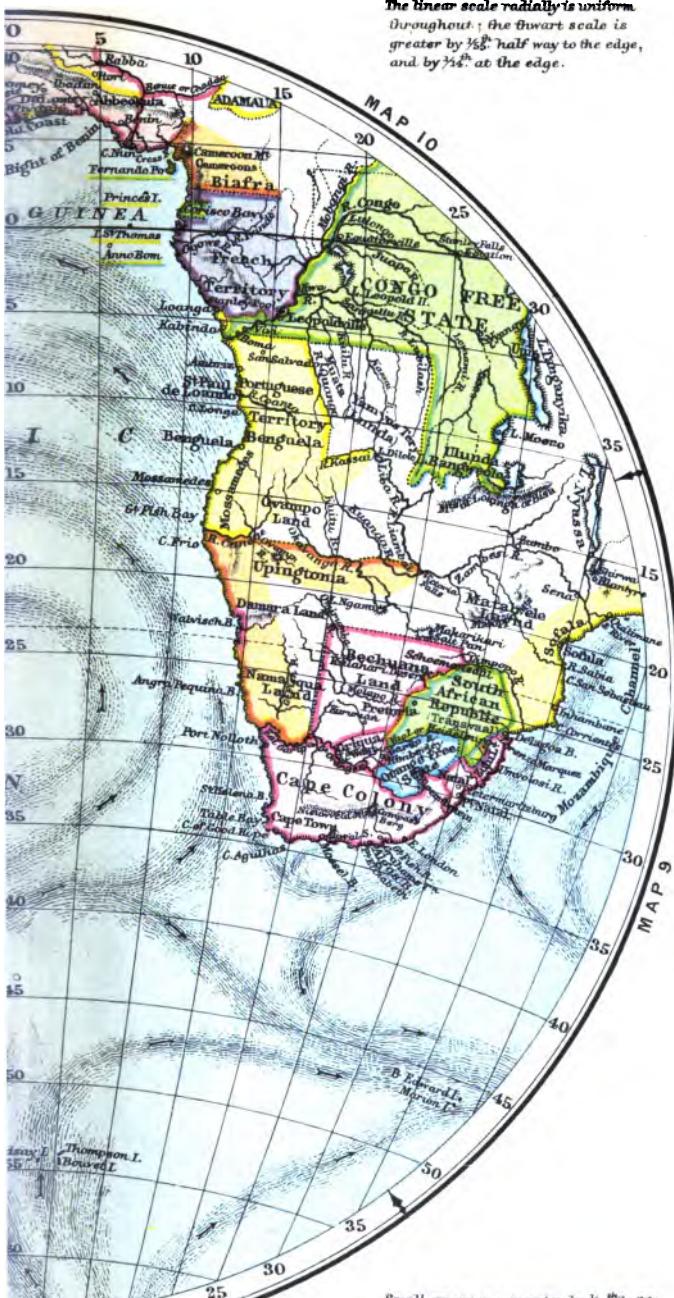


*Scale of Miles at centre of map,
and radially all over map.*
English Miles

0 50 100 200 400 600 800 1000

London, Lon

The linear scale radially is uniform throughout; the thwart scale is greater by $\frac{1}{15}^{\text{th}}$ half way to the edge, and by $\frac{1}{14}^{\text{th}}$ at the edge.

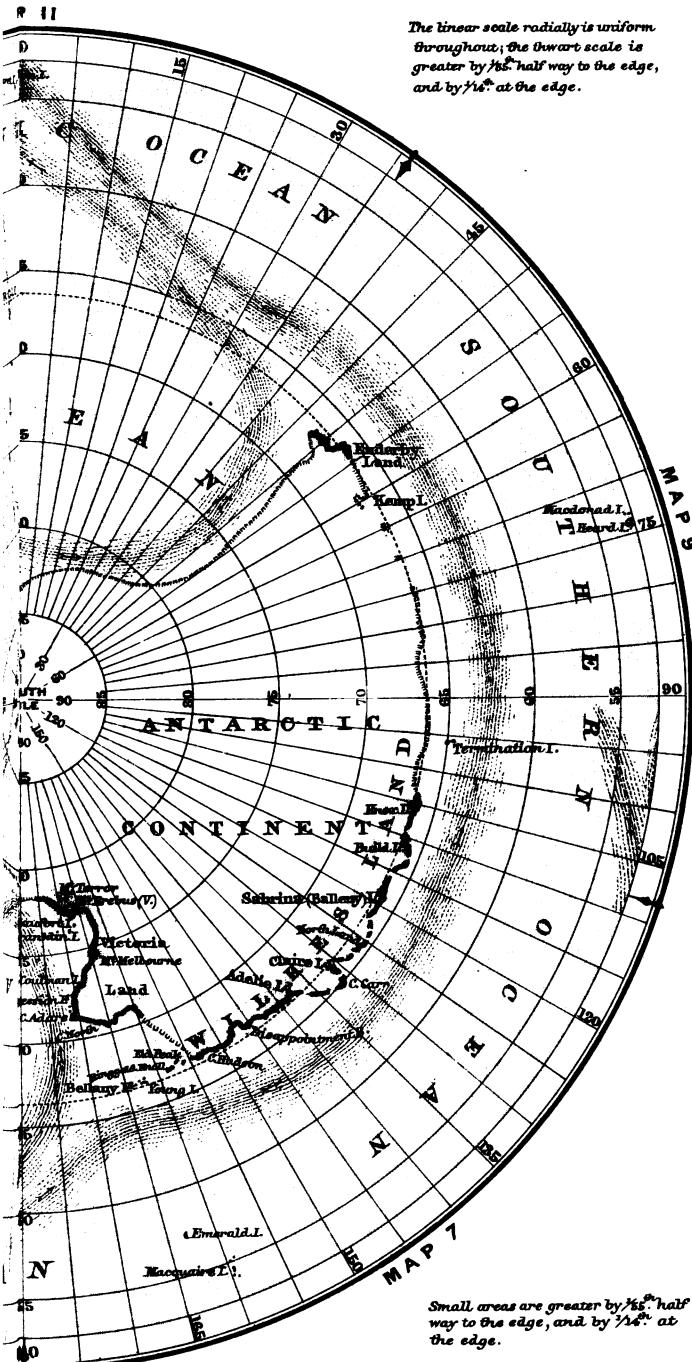


MAP XI

**GUINEA, SOUTHERN AFRICA, CONGO, BECHUANA,
CAPE COLONY &c. AND SOUTHERN ATLANTIC.**

MAP XII

**ANTARCTIC REGIONS, ANTARCTIC OCEAN,
SOUTHERN OCEAN AND SOUTHERN ATLANTIC.**



F. S. Weller, F.R.G.S.

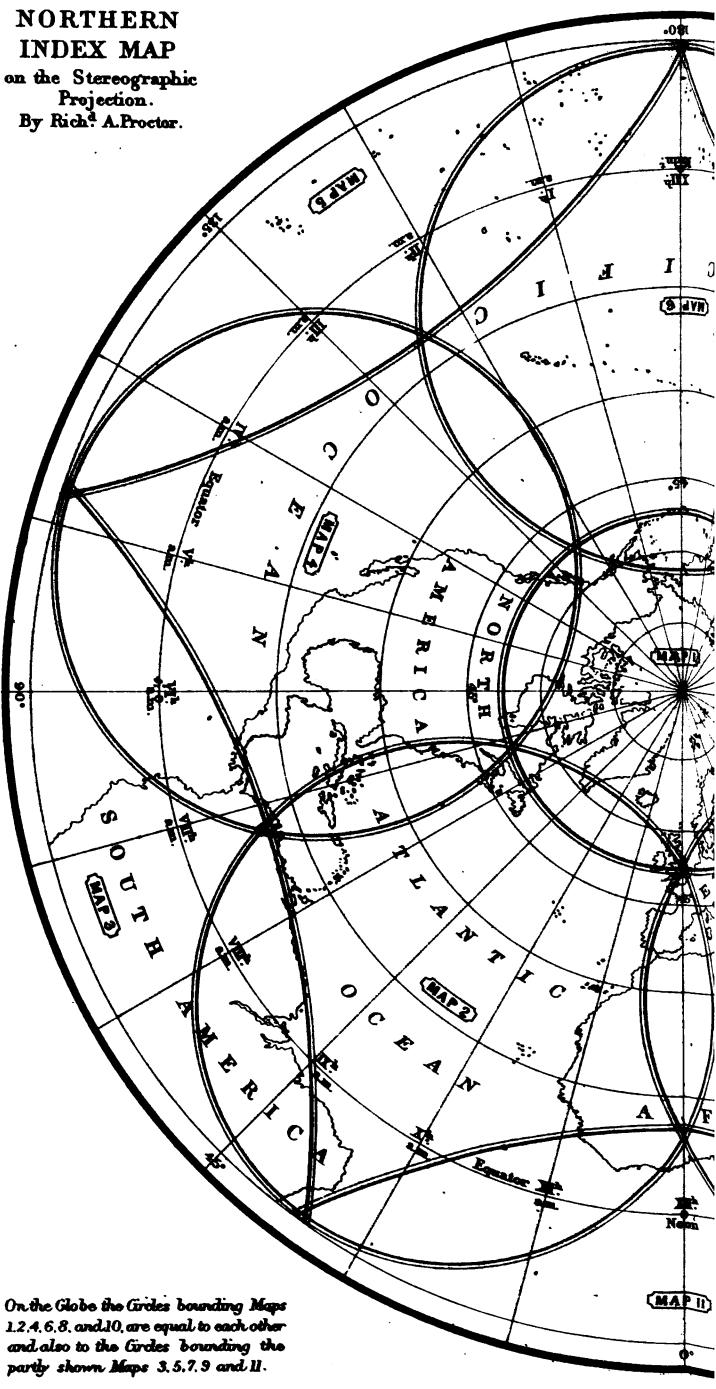
MAP XII

***ANTARCTIC REGIONS, ANTARCTIC OCEAN,
SOUTHERN OCEAN AND SOUTHERN ATLANTIC.***

NORTHERN INDEX-MAP

Showing the relative positions of Maps
I, II, IV, VI, VIII & X
and parts of Maps
III, V, VII, IX & XI

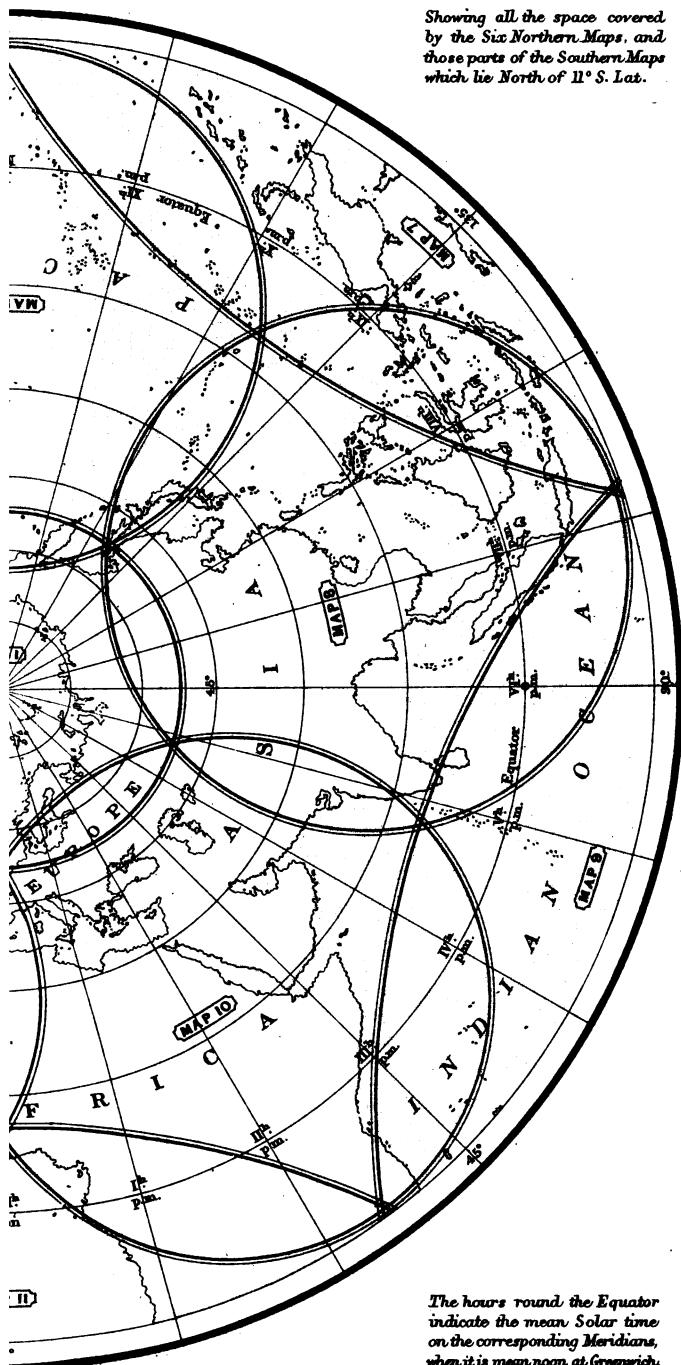
**NORTHERN
INDEX MAP**
on the Stereographic
Projection.
By Rich^d. A. Proctor.



On the Globe the Circles bounding Maps 1, 2, 4, 6, 8, and 10, are equal to each other and also to the Circles bounding the party shown Maps 3, 5, 7, 9 and 11.

London. Longman

*Showing all the space covered
by the Six Northern Maps, and
those parts of the Southern Maps
which lie North of 11° S. Lat.*



*The hours round the Equator
indicate the mean Solar time
on the corresponding Meridians,
when it is mean noon at Greenwich.*

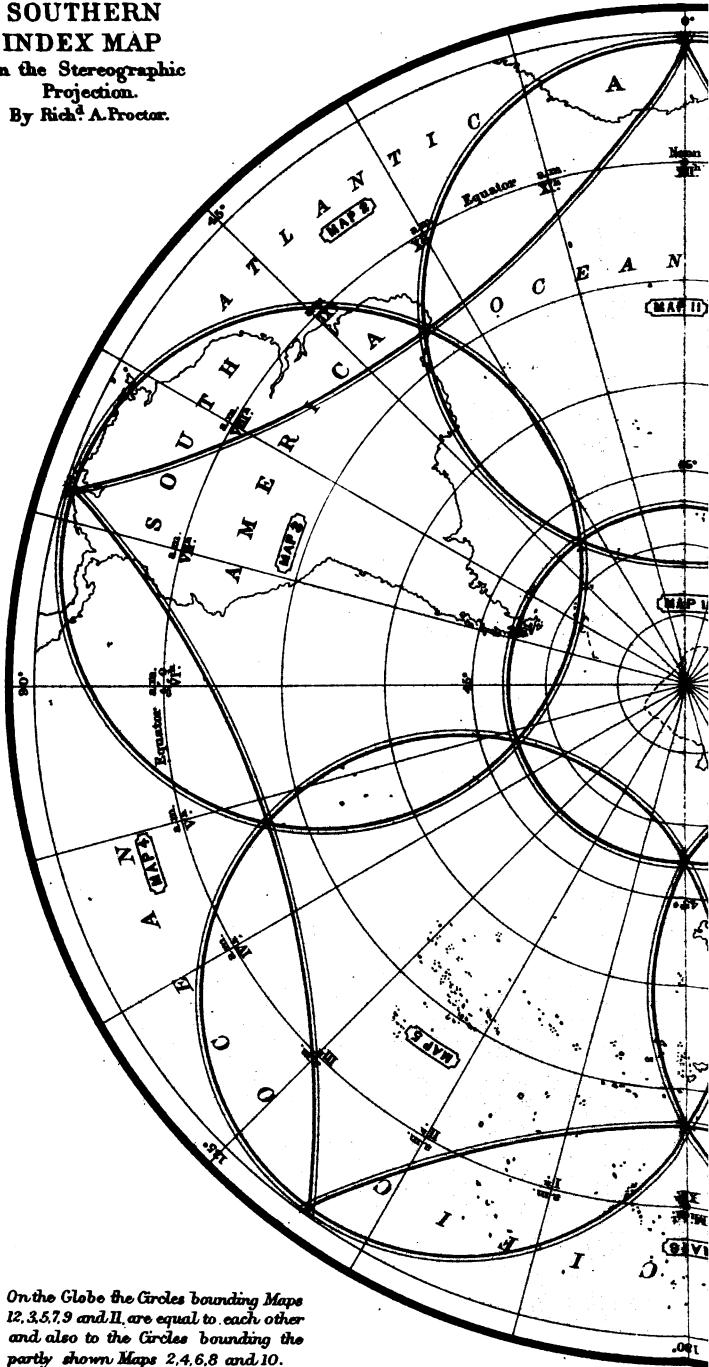
NORTHERN INDEX-MAP

Showing the relative positions of Maps
I, II, IV, VI, VIII & X
and parts of Maps
III, V, VII, IX & XI

SOUTHERN INDEX-MAP

Showing the relative positions of Maps
XII, III, V, VII, IX & XI
and of parts of Maps
II, IV, VI, VIII & X

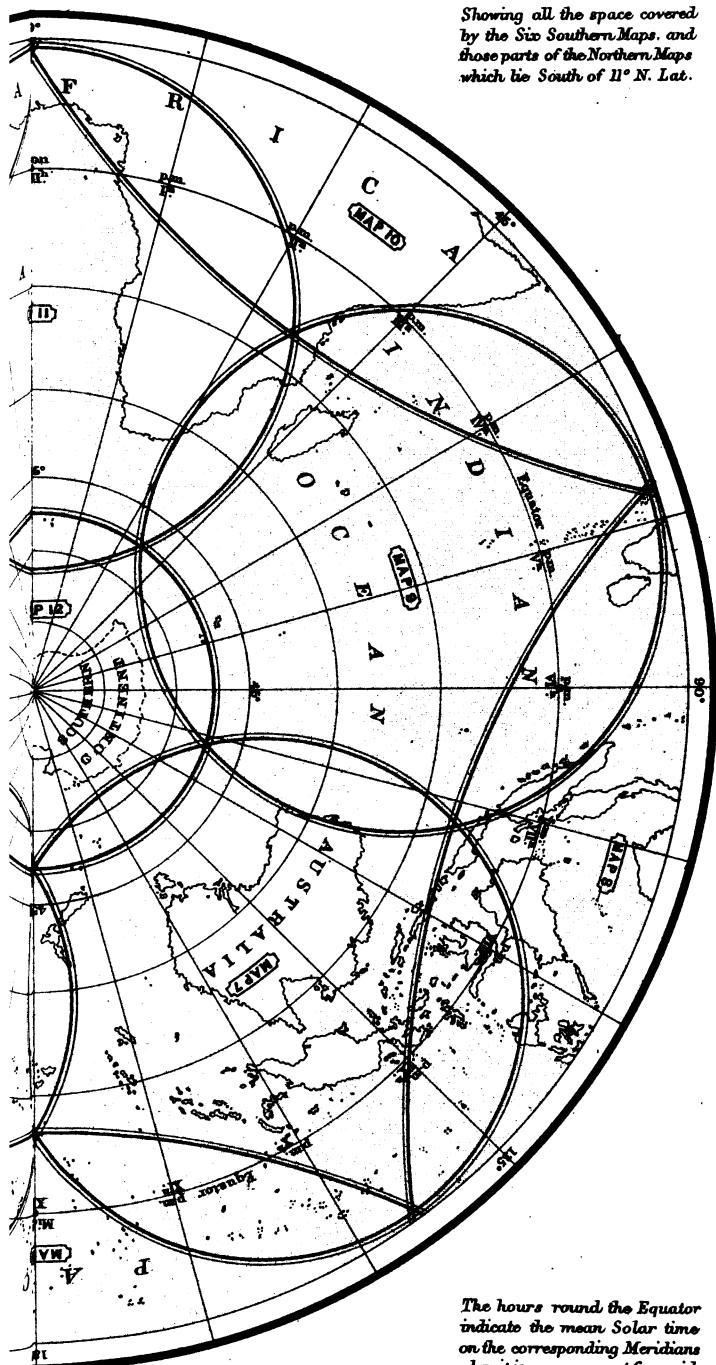
SOUTHERN
INDEX MAP
on the Stereographic
Projection.
By Richd. A. Proctor.



On the Globe the Circles bounding Maps
12, 2, 5, 7, 9 and 11, are equal to each other
and also to the Circles bounding the
partly shown Maps 2, 4, 6, 8 and 10.

London, Long.

*Showing all the space covered
by the Six Southern Maps, and
those parts of the Northern Maps
which lie South of 11° N. Lat.*



*The hours round the Equator
indicate the mean Solar time
on the corresponding Meridians
when it is mean noon at Greenwich.*

SOUTHERN INDEX-MAP

Showing the relative positions of Maps
XII, III, V, VII, IX & XI
and of parts of Maps
II, IV, VI, VIII & X



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